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Lost in the Crowd: Conformity as Escape Following Disbelief in Free Will

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Abstract

Belief in free will is founded on the idea that people are responsible for their behavior. People who believe in free will derive meaning in life from these beliefs. Conformity refers to succumbing to external pressures and imitating others' behaviors. Sometimes, conformity involves a loss of self-awareness, which reduces perceived meaninglessness. We tested if disbelief in free will increases perceived meaninglessness and if people subsequently become more conformist to address this negative existential perception. We conducted three studies to test this hypothesis. In Study 1, experimentally induced disbelief in free will resulted in perceived meaninglessness. In Study 2, perceived meaninglessness correlated with conformity. Finally, in Study 3, perceived meaninglessness mediated the relationship between disbelief in free will and conformity, especially under high self-awareness. We conclude that perceptions about meaning play a central role in the relationship between disbelief in free will and conformity.

Keywords: free will, conformity, meaning, self-awareness, existential psychology

Lost in the Crowd: Conformity as Escape Following Disbelief in Free Will

Belief in free will involves trusting in one's ability to make choices based on one's own thoughts and values and being resistant to external pressures (Baumeister, 2008a, 2008b; Baumeister, Crescioni, & Alquist, 2011; Feldman, Baumeister, & Wong, 2014; Feldman, Chandrashekar, & Wong, 2016). Accordingly, belief in free will fosters thoughtful reflection (Baumeister, Masicampo, & DeWall, 2009; Rigoni & Brass, 2014) and gives people a sense of meaning. In contrast, the absence of free will beliefs renders life as less meaningful (Crescioni, Baumeister, Ainsworth, Ent, & Lambert, 2016; Moynihan, Igou, & Van Tilburg, 2017a).

Conformity refers to a change in behavior or belief designed to imitate or match those of real or imagined others (Cialdini & Trost, 1998). In some cases, rather than behaving in accordance with one's values and judgments, people who conform yield to social pressure elicited by individuals and groups (Arndt, Schimel, Greenberg, & Pyszczynski, 2002). People conform due to different motivational orientations (e.g., Deutsch & Gerard, 1955): to obtain an accurate interpretation of reality, gain social approval, or maintain a positive self-concept (Cialdini & Goldstein, 2004; Cialdini & Trost, 1998). Hence, conformity can be an active, effortful process (e.g., Haslam & Reicher, 2012) or involve less cognitive engagement (e.g., while conforming to descriptive rather than injunctive norms; Cialdini, 2003). Our hypothesis concerns the latter facet of conformity that is the antagonist of belief in free will regarding self-determination. We tested if disbelief in free, associated with a lack of perceived meaning in life (Crescioni et al., 2016; Moynihan et al., 2017a), increases conformity as a means to escape this unfavorable existential state.

Our research extends on earlier work by Alquist, Ainsworth, and Baumeister (2013) by investigating if the relationship between disbelief in free will and conformity can be interpreted as an attempt at escaping meaninglessness (Wisman, 2006). Alquist et al.'s,

(2013) findings hinted at the relationship between meaninglessness and disbelief in free will. In this regard, our research elaborates upon the causal link between disbelief in free will and conformity and their psychological underpinnings by adapting a different theoretical perspective. Accordingly, we incorporate the roles of two key constructs, meaninglessness perceptions and self-awareness.

Conformity as Withdrawal

Conformity buffers against meaninglessness by bolstering others' approval, social ties, worldviews, self-esteem (e.g., Castano, Yzerbyt, & Paladino, 2004), and self-certainty (e.g., Gaffney & Hogg, 2017). Yet, we focus on the facet of conformity that is instigated by a deficit in effortful volition (Alquist et al., 2013), to provide an escape from meaninglessness by facilitating lowered self-awareness. In this regard, conformity can be used to cope with certain stressors (e.g., Gudjonsson, 1988, 1989; Gudjonsson, & Clark 1986; Gudjonsson & Sigurdsson, 2003).

Gudjonsson and Sigurdsson (2003) note that this type of conformity is associated with rejecting the reality of stressful events, withdrawing effort (e.g., Asch, 1952), and low levels of deliberation and control (Alquist et al., 2013; Epley & Gilovich, 1999). People can be consistent with a person or group without much thought, attention, or awareness of the self and one's relationships to others (Bargh, 1994; Bremner, 2002; Chartrand & Bargh, 1999; Gopnik, Meltzhoff, & Kuhl, 1999; Griskevicius, Goldstein, Mortensen, Cialdini, & Kenrick, 2006). Therefore, the route to conformity, in some circumstances, might be a habitual, automatic, low deliberation process (e.g., Epley & Gilovich, 1999; Pendry & Carrick, 2001), and a withdrawal from awareness of discomforting information regarding the self and the social situation.

Disbelief in Free Will and Conformity

Conformity may be a particularly useful strategy to deal with threats to belief in free will (Alquist et al., 2013). Forming opinions, resisting others' influence, considering multiple options, and asserting them, requires effort (Kahan, Polivy, & Herman, 2003; Rigoni & Brass, 2014) and is cognitively depleting (Gailliot et al., 2007; Vohs et al., 2008). Accordingly, disbelief in free will facilitates a process to conform to other people's expectations and wishes (Alquist et al., 2013; see also Feldman et al., 2014).

Specifically, disbelief in free will diminishes the recruitment of cognitive resources for self-regulation and volition (Lynn, Van Dessel, & Brass, 2013; Lynn, Muhle-Karber, Aarts, & Brass, 2014; Rigoni, Kuhn, Sartori, & Brass, 2011; Rigoni, Pourtois, & Brass, 2015) and lessens feelings of responsibility and accountability (Clark et al., 2014; Stillman & Baumeister, 2010; Tetlock, 1983). Indeed, conformity can be used as a strategy to deal with feelings of diminished responsibility (Tetlock, Skitka, & Boettger, 1989) by selecting less demanding choices (Rigoni et al., 2011), as is the case under disbelief in free will. As a result, autonomous thought and action needed for volition and self-control are reduced and instead conformity as a means to reduce self-related awareness and consciousness may be enacted (e.g., Baumeister, Bratslavsky, Muraven, & Tice, 1998; Baumeister et al., 2009; Baumeister, Vohs, & Tice, 2007; Rigoni, Kuhn, Gaudino, Sartori, & Brass, 2012).

Disbelief in Free Will and Meaninglessness

Additionally, life can appear meaningless without believing in free will (Alquist et al., 2013; Bergner & Ramon, 2013; Davidov & Eisikovits, 2015; Flanagan, 1996). Belief in free will subsumes control (Baumeister, 2008a, 2008b; Baumeister et al., 2010; 2011; Seto, Hicks, Davis, & Smallman, 2014; Vohs & Baumeister, 2010), an important source of meaning (Heine, Proulx, & Vohs, 2006; Shariff, Schooler, & Vohs, 2008), and enhances the sense of control people experience when making decisions (Feldman et al., 2014; Feldman et al.,

2016; Stillman, Baumeister, & Mele, 2011). Since autonomy, afforded by free will beliefs (Baumeister et al., 2009), plays a role in optimal human functioning, deprivation of this key aspect of human life may contribute to meaninglessness (Bergner & Ramon, 2013; Heine et al., 2006; Kim, Seto, Davis, & Hicks, 2014; Seto et al., 2014). Indeed, belief in free will promotes meaning by allowing people to set meaningful goals (Crescioni et al., 2016) and achieve further sources of meaning (e.g., belongingness; Moynihan et al., 2017a).

When people face a lack of or challenge to meaning, they attempt to address or avert this threat (Heine et al., 2006). Such strategies include conformity (Arndt et al., 2002; Pyszczynski et al., 1996; Simon et al., 1997; Wisman & Koole, 2003; Wisman & Shrira, 2006). We reason that the lack of perceived meaning that comes with disbelief in free will likewise elicits defensive responses. That is, we propose that conformity can be used as a defensive response to deal with perceived meaninglessness, indicated by disbelief in free will.

Our hypothesis is consistent with established theoretical frameworks such as the meaning maintenance model (e.g., Heine et al., 2006). Nonetheless, conformity involving a withdrawal from the self is a process that is particularly well informed by the existential escape hypothesis (Wisman, 2006), which extends on previous frameworks. Thus, our general reasoning follows the meaning maintenance model while the existential escape hypothesis allows us to make particular predictions with regard to our chosen research topic.

Conformity as an Escape From Meaninglessness

We propose that conformity is a means of dealing with adverse perceptions of meaninglessness, captured by self-awareness (e.g., Wisman, 2006; Wisman & Koole, 2003). The extent to which people are affected by a challenge to meaning depends on how strongly they are inclined to introspection, represented by individual differences in self-awareness (Taubman & Noy, 2010; Wisman, Heflick, & Goldenberg, 2015). Thus, people with a tendency for symbolic self-awareness are more acutely aware if a lack of meaning is present

(Kim et al., 2014). Symbolic self-awareness refers to people's capacity for a flexible, multi-faceted, and abstract cognitive representation of one's own attributes (Sedikides & Skowronski, 1997; Skowronski & Sedikides, 2017). Directing attention toward the self initiates an evaluative process, in which one's current state is compared with ideal standards on salient dimensions (e.g., meaninglessness; Duval & Wicklund, 1972). As a result, perceived discrepancies between the actual self (meaningless) and ideal self (meaningful) are enhanced (Duval, Duval, & Mulilis, 1992; Phillips & Silvia, 2005; Silvia, 2001).

Consistently, perceptions of meaning-threats are enhanced under conditions of greater self-awareness (Sedikides & Skowronski, 2003; Taubman Ben-Ari & Noy, 2010). These discrepancies encourage people to address adverse self-awareness (e.g., Arndt, Greenberg, Simon, Pyszczynski & Solomon, 1998; Carver, 1975; Duval & Wicklund, 1972; Gollwitzer & Wicklund, 1985; Silvia & Duval, 2001; Silvia & Phillips, 2013). Thus, when beliefs in free will are challenged, people may seek to avoid self-awareness associated with increased perceptions of meaninglessness.

Given that conformity engenders a loss of self-awareness in some circumstances (Diener, 1979; Mullen, 1991; Zimbardo, 2007), Wisman (2006) suggested that conformity may be used as an existential response to meaninglessness (e.g., Arndt et al., 2002; Wisman & Koole, 2003; Wisman & Shrira, 2006). Indeed, when objective self-awareness is lowered via conformity, one ceases comparing one's behavior against internal standards (e.g., self-discrepancies; Mann, Newton, & Innes, 1982). Accordingly, conformity may be used to dampen perceived meaninglessness in the symbolic self, signaled by meaning threats (e.g., Wisman, 2006). Further, conformity may be a particularly suitable method to address meaninglessness signaled by disbelief in free will considering that the former may at times be a habitual, spontaneous response (e.g., Arndt et al., 2002), facilitated by lowered volition and

promoted by challenges to belief in free will (e.g., Alquist et al., 2013; Baumeister et al., 2009; Stillman et al., 2011).

Consistently, Wisman and Koole (2003) found that mortality salience, another meaning threat, led to increased tendencies to sit with others, as opposed to sitting alone. Critically, this occurred even if the group members threatened participants' worldviews, a source of meaning. In a replication, Wisman and Shrira (2006) also noted that participants were unwilling to increase contact with confederates. That is, participants sought to lose themselves in a group rather than defend or attack their worldviews or ultimately using symbolic self-awareness (Sedikides & Skowronski, 2003). Consistently, in line with our chosen existential escape approach (e.g., Kesebir & Pyszczynski 2012; Wisman, 2006), we argue that conformity in response to disbelief in free will may be understood, at least in part, as a means of dealing with perceived meaninglessness associated with challenging such beliefs, particularly among those high in self-awareness.

The Present Research

We investigated conformity as a response to the perceived meaninglessness that disbelief in free will instigates. We did this in three studies using experimental and correlational designs. In Study 1, we tested if there was a causal effect of disbelief in free will on meaninglessness. In Study 2, we investigated the relationship between perceived meaninglessness and conformity using correlational data. In Study 3, we investigated if the relationship between disbelief in free will and conformity is mediated by perceived meaninglessness (i.e., people conform in response to the perceived meaninglessness that comes with disbelief in free will), using a correlational design. We also measured individual differences in self-awareness in Study 3. In accordance with the literature (e.g., Kesebir & Pyszczynski, 2012; Moynihan et al., 2015; Moynihan, Igou, & Van Tilburg, 2017b; Wisman, 2006; Wisman et al., 2015), we predicted that perceptions of meaninglessness following

disbelief in free will would be associated with increased conformity, at higher levels of dispositional self-awareness.

Study 1

We investigated if disbelief in free will promotes perceptions of meaninglessness. Again, belief in free will enhances the sense of control people experience when making decisions (Feldman et al., 2016; Stillman et al., 2011). Self-control is an important source of meaning (Heine et al., 2006; Shariff et al., 2008) because personal choice over one's outcomes, provided by free will beliefs, makes events and experiences seem meaningful (Bergner & Ramon, 2014; Seto et al., 2014). Depriving this key aspect of human life may contribute to meaninglessness (Heine et al., 2006; Kim et al., 2014) and prevent people from achieving other sources of meaning (e.g., belongingness; Moynihan et al., 2017a). Although the relationship between belief in free will and meaningfulness has been identified in previous research (Crescioni et al., 2016), we aimed to corroborate disbelief in free will's credentials as a meaning threat, considering the lack of experimental research in this area. We predicted that disbelief in free will would be associated with increased meaninglessness (Bergner & Ramon, 2013; Kim et al., 2014; Seto et al., 2014). To test our hypothesis, participants read a passage either endorsing or dismissing the idea of belief in free will (MacKenzie, Baumeister, & Vohs, 2014; Vohs & Schooler, 2008). Subsequently, participants completed measures of threat to belief in free will and to meaningfulness. Importantly, we used different materials from earlier research for convergent validity (Crescioni et al., 2016).

Method

Participants and design. Eighty-five participants were recruited from *ProlificAcademic.co.uk* (M_{age} = 32.47, *SD* = 11.50, range = 18-73; 35 women, 50 men). Prolific Academic is a data collection website, founded by academic researchers, where participants can complete surveys for payment. All participants reported acceptable English

and were paid €0.44 each. Study 1 was a between-subjects (free will: belief vs. disbelief) experiment. No participants were excluded from analysis.

We used the effect and sample sizes from previous literature (Bergner & Ramon, 2013; Crescioni et al., 2016) as guidance for an appropriate sample size for Study 1. Post-hoc analyses showed that our sample size allowed us to detect significant differences between experimental conditions with effect sizes of $\eta^2 = 0.08$ or more (Faul, Erdfelder, Lang, & Buchner, 2007) with a power of 0.76 when adopting a Type-I error rate of $\alpha \leq .05$ (two-tailed). Data collection was completed prior to analyzing the data.

Materials and procedure. Participants gave their informed consent and reported demographics. Next, participants were randomly assigned to one of two experimental conditions. Our free will belief manipulation required participants to read a passage of text (Vohs & Schooler, 2008). Participants were told that the study was a reading comprehension on psychology. The text argued either for or against the existence of free will, depending on condition. Both passages were modified extracts from 'The Astonishing Hypothesis' by Francis Crick (1994). In the control condition, participants read a passage on the nature of consciousness. In the experimental condition, participants read a passage, of roughly equal length, which dismissed the idea of belief in free will. This passage contained the lines: "…your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules" and "…one is not conscious of the 'computations' done by this part of the brain but only of the 'decisions' it makes – that is, plans." In addition, the anti-free will condition was modified slightly by including the lines "Everything people are and do is the product of simple, physical processes in their brains" and "There is no need for the existence of free will to explain how we behave." Similarly, the control condition included the extra lines "Everything people are and do is mostly a product

of the decisions they make and their free will" and "There is a strong need to consider free will when trying to explain human behavior" (MacKenzie et al., 2014).

Previous research showed that reading the experimental (versus control) condition's passage caused decreased activity in cerebral areas associated with voluntary motor preparation, error detection (Lynn et al., 2014; Rigoni et al., 2011; Rigoni et al., 2015), and reduced ethical behavior (Vohs & Schooler, 2008). In addition, the manipulation fosters changes in free will belief specifically and does not seem to affect feelings of accountability, agency, mood, locus of control, conscientiousness, Protestant work ethic, or learned helplessness (Baumeister et al., 2009).

To ensure that they comprehended the main point, participants typed a summary of the essay, while the essay was still on screen, listing at least three key points. The 'Continue' button was programmed to appear after two minutes to give participants time to read the text and write the summary. A content analysis of the summaries confirmed that all participants paid attention to the texts. As manipulation check, we asked participants: "How much did the text you read cast doubt on the belief that you have free will?" (1 = *not at all*, 7 = *very much*; $M = 3.46$, $SD = 1.94$). In addition, participants rated meaninglessness: "To what extent did the text you read make you feel a sense of meaninglessness?" (1 = *not at all*, 7 = *very much*; $M = 2.95$, $SD = 1.82$; Alquist et al., 2013; Routledge et al., 2011).[1] Afterwards, participants were debriefed, thanked, and rewarded for their participation. Descriptive statistics are reported in Table 1.

Results and Discussion

Manipulation check. We entered participants' scores on the manipulation check item as the dependent variable in a one-way ANOVA with the free will belief manipulation (free will: belief vs. disbelief) included as the independent variable. As predicted, participants who read the passage arguing against free will reported significantly greater doubts on their free

will beliefs (M = 4.12, SD = 1.89) than those who read a passage arguing in favor of free will (M = 2.56, SD = 1.65), $F(1,83) = 15.89$, $p < .001$, $\eta^2 = 0.16$. Thus, our manipulation was effective.

Meaninglessness. Participants' responses to the meaninglessness item were entered as the dependent variable in a one-way ANOVA with the free will belief manipulation as the independent variable. As expected, participants in the disbelief in free will condition reported significantly more meaninglessness after reading the text (M = 3.39, SD = 1.88) than those in the belief in free will condition (M = 2.36, SD = 1.57), $F(1,83) = 7.09$, $p = .009$, $\eta^2 = 0.08$.[2]

Study 1's findings suggested that a belief in free will manipulation simultaneously elicited differences in meaninglessness, suggesting the meaning-regulation function of belief in free will. Although the relationship between disbelief in free will and meaninglessness has been investigated previously (Crescioni et al., 2016), to our knowledge, Study 1 is the first experiment to replicate this relationship using different materials.

It could be argued that the manipulation check and dependent variable in Study 1 were uninformative because they didn't indicate whether participants' belief in free will changed as a result of the essay they read, whether belief in free will bolstered meaning, or if disbelief in free will reduced meaning. Rather, the items asked to what extents the text cast doubt on belief in free will and made participants feel a sense of meaninglessness. We believe that these were appropriate items. These measures have been used by other free will and meaning researchers (e.g., Alquist et al., 2013; Routledge et al., 2011). Based on how these items were worded and their positive correlation, our data showed that when beliefs in free will are challenged by a particular source, people feel a sense of meaninglessness from the same source.

Additionally, some people may be hesitant to reduce belief in free will as the belief gives them a sense of meaningfulness. Rather, the *challenge* to these beliefs is what leads to

meaninglessness. It is also possible that people who value these meaningful beliefs may cling to them when challenged (e.g., Heine et al., 2006). Some researchers have also suggested that asking participants to indicate the extent to which they believe in free will or have meaning may not be appropriate as state measures because the wording often implies trait qualities (Paulhus & Carey, 2011). These trait measures may not adequately capture the meaning threat of current challenges to belief in free will and meaning. In any case, we used different multi-item measures of free will beliefs and meaninglessness in our remaining studies for convergent validity.

Study 2a and 2b

Study 1 showed that threats to belief in free will causes perceived meaninglessness. In Study 2, we investigated the proposed, and yet empirically untested, relationship between meaninglessness and conformity. Study 2 was divided into two sub-studies. Study 2a was a correlational study that investigated the relationship between perceived meaninglessness and conformity. Study 2b adapted the same correlational design but investigated the relationship between meaninglessness and a concept closely related to conformity: compliance (Cialdini & Trost, 1998; Cialdini & Goldstein, 2004; Gudjonsson, 1989).[3]

Like conformity (e.g., Diener, 1979; Mullen, 1991; Zimbardo, 2007), compliance can, in some cases, lower objective self-awareness (e.g., to avoid confrontation with others, Milgram, 1974; Tilker, 1970; Zimbardo, 2007); a strategy that may be useful in response to meaning threats (Wisman & Koole, 2003; Wisman & Shrira, 2006). In the development of the measure of compliance that we adopted in Study 2b (Gudjonsson, 1989), a factor was identified on avoidance behavior (i.e., losing the symbolic self). This factor seems particularly relevant regarding our chosen theoretical framework (Wisman, 2006) and is also relevant to conformity (e.g., Diener, 1979; Mullen, 1991; Zimbardo, 2007). For exploratory

purposes, we investigated the correlation between meaninglessness and this factor in Study 2b.

Method

Participants and design. In Study 2a, 80 participants were recruited at *ProlificAcademic.co.uk* (M_{age} = 29.48, *SD* = 10.20, age range = 18-60; 27 women, 53 men). All participants reported acceptable English. Participants were remunerated with €0.26 each. No participants were excluded.

In Study 2b, 107 participants were recruited at *ProlificAcademic.co.uk* (M_{age} = 31.26, *SD* = 9.93, range = 19-60; 43 women, 63 men, 1 undeclared). All participants reported acceptable English. No participants were excluded. Participants were remunerated with €0.31 each.

In Study 2a, a post-hoc analysis showed that our sample size allowed us to detect our achieved correlation coefficient with a power of 0.72 when adopting a Type-I error rate of $\alpha \leq .05$ (two-tailed; Faul, Erdfelder, Buchner, & Lang, 2009). In Study 2b, a post-hoc analysis showed that our sample size allowed us to detect our achieved correlation coefficients with a power of 0.70 and 0.93 respectively, when adopting a Type-I error rate of $\alpha \leq .05$ (two-tailed; Faul et al. 2009). In Study 2a, data collection was completed prior to analyzing the data. In Study 2b, data was collected in two stages, checked after recruiting the initial subsample, and fully analyzed after recruiting the overall sample.[4]

Materials and procedure. In both studies, participants gave their informed consent and reported demographics. In Study 2a, participants completed measures of perceived meaninglessness and conformity in a random order. Perceived meaninglessness was measured using five items adapted from earlier research by Van Tilburg and Igou (2013; e.g., "I often experience a sense of meaninglessness"; 1 = *strongly disagree*, 7 = *strongly agree*; *M* = 3.68, *SD* = 1.55; α = .91). Conformity was measured using the ten-item conformity scale

(Mehrabian & Stefl, 1995; e.g., "I often rely on, and act upon, the advice of others"; 1 = *not at all true of me*, 7 = *extremely true of me*; M = 3.42, SD = 0.89; α = .80). Afterwards, participants were debriefed, thanked, and rewarded.

In Study 2b, participants were presented with measures of perceived meaninglessness and compliance in a random order. Meaninglessness was measured using the same scale as in Study 2a (M = 3.51, SD = 1.45; α = .90; Van Tilburg & Igou, 2013).

We measured compliance using the twenty-item Gudjonsson compliance scale (Gudjonsson, 1989). We modified the measure using an interval scale (e.g., "I give in easily when I am pressured"; 1 = *not at all true of me*, 7 = *extremely true of me*; M = 3.80, SD = 0.80; α = .85). The avoidance behavior factor of the compliance scale contained ten items (e.g., "I believe in avoiding rather than facing demanding and frightening situations"; 1 = *not at all true of me*, 7 = *extremely true of me*; M = 3.67, SD = 0.90, α = .78). Afterwards, participants were debriefed, thanked, and rewarded. Descriptive statistics are reported in Table 2.

Results and Discussion

In Study 2a, meaninglessness correlated positively and significantly with conformity, $r(78) = .29$, $p = .010$, 95% CI [0.07, 0.48]. In Study 2b, meaninglessness correlated positively and significantly with compliance, $r(104) = .23$, $p = .018$, 95% CI [0.04, 0.40], and with the avoidance factor, $r(104) = .33$, $p = .001$, 95% CI [0.14, 0.49].

Our hypothesis was supported; meaninglessness correlated with increased conformity, compliance, and avoidance behaviors. These findings are consistent with losing the self by conforming to others so as to avoid awareness of the symbolic self, necessary to perceive meaning threats (e.g., Wisman, 2006; Wisman & Koole, 2003). Furthermore, the effect size for the avoidance aspect of compliance was more strongly related to meaninglessness, suggesting that this specific aspect of compliance (and also conformity)

may be most relevant for dealing with meaning-threats in the context of existential escape (Wisman, 2006).

To our knowledge, Studies 2a and 2b are the first studies to investigate a specific relationship between perceived meaninglessness, conformity, and compliance. Having established that regularly experiencing a sense of meaninglessness was associated with conformity, we investigated whether disbelief in free will is associated with increased conformity via perceptions of meaninglessness.

Study 3a and 3b

In Study 3, we integrated the key constructs from Studies 1-2 into one comprehensive design. We predicted that disbelief in free will would promote conformity as a function of increased perceptions of meaninglessness. Study 3 was divided into two sub-studies. We investigated the relationship between disbelief in free will, perceived meaninglessness, and conformity using a correlational design in Study 3a.

Further, we predicted that conformity in response to a meaning threat (e.g., disbelief in free will) is enacted to address the perceived meaninglessness of those threats, in particular at high levels of self-awareness. Perceptions of meaninglessness are sourced in the symbolic self (Carver, 1975; Duval & Wicklund, 1972; Gollwitzer & Wicklund, 1985; Silvia & Duval, 2001; Silvia & Phillips, 2013) and enhanced under conditions of greater self-awareness (Sedikides & Skowronski, 2003; Taubman Ben-Ari & Noy, 2010). We predicted that the proposed indirect effect of disbelief in free will on conformity would be stronger at higher levels of self-awareness (e.g., a conditional indirect effect), in line with previous existential escape literature (Moynihan et al., 2015; Moynihan et al., 2017b; Wisman et al., 2015). Accordingly, we included a measure of self-awareness for our proposed model in Study 3b.

Method

Participants and design. Ninety-six participants were recruited at *ProlificAcademic.co.uk* for Study 3a (M_{age} = 28.17, *SD* = 8.87, age range = 18-67; 39 women, 57 men). All participants reported acceptable English. Participants were remunerated with €0.22. No participants were excluded from analysis. We used the effect sizes from previous literature (e.g., Moynihan et al., 2017a), and Study 2a as guidance for an appropriate sample size for Study 3a. Post-hoc analyses showed that our sample size allowed us to detect our achieved indirect effect with a power of 0.48 when adopting a Type-I error rate of $\alpha \leq .05$, 10,000 power analysis replications, and 20,000 Monte Carlo draws per replications (two-tailed; Schoemann, Boulton, & Short, 2017). Data collection for Study 3a was completed prior to analyzing the data.

In Study 3b, two hundred and three participants were recruited at *ProlificAcademic.co.uk* (M_{age} = 28.14, *SD* = 9.50, age range = 18-59; 78 women, 124 men, 1 undeclared). All participants reported acceptable English. Participants were remunerated with €0.30. No participants were excluded from analysis. We used the effect sizes from previous literature (e.g., Moynihan et al., 2017a), Study 2a, and Study 3a as guidance for an appropriate sample size. Post-hoc analyses showed that our sample size allowed us to detect our achieved indirect effect with a power of 0.68 when adopting a Type-I error rate of $\alpha \leq .05$, 10,000 power analysis replications, and 20,000 Monte Carlo draws per replications (two-tailed; Schoemann et al., 2017). Data collection for Study 3b was completed in two stages, checked after recruiting the initial subsample, and fully analyzed after recruiting the overall sample.[5]

Materials and procedure. In Study 3a, participants gave their informed consent and reported demographics. Next, three scales measuring belief in free will, perceived meaninglessness, and conformity were presented in random order. Belief in free will was

measured using the seven-item free will belief subscale of the free will and determinism scale - plus (Paulhus & Carey, 2011). For this study, items on the subscale were reversed-scored to measure *disbelief* in free will (e.g., "People are always at fault for their bad behavior" – reverse-scored; 1 = *strongly disagree*, 7 = *strongly agree*; *M* = 2.72, *SD* = 1.05; α = .83).

We measured perceived meaninglessness using the five-item scale from Study 2 (e.g., "I often experience a sense of meaninglessness"; 1 = *strongly disagree*, 7 = *strongly agree*; *M* = 3.71, *SD* = 1.60, α = .89, Van Tilburg & Igou, 2013). Finally, we measured conformity using the ten-item conformity scale, as used in Study 2a (e.g., "I tend to rely on others when I have to make an important decision quickly"; 1 = *not at all true of me*, 7 = *extremely true of me*; *M* = 3.49, *SD* = 0.86; α = .74; Mehrabian & Stefl, 1995). Descriptive statistics are reported in Table 3.

For Study 3b, participants again gave their informed consent and reported demographics. Next, four scales measuring belief in free will, perceived meaninglessness, trait levels of self-awareness, and conformity were presented in random order. Belief in free will was again measured using the seven-item free will belief subscale of the free will and determinism scale - plus (Paulhus & Carey, 2011). Items on the subscale were also reversed-scored to measure *disbelief* in free will (*M* = 2.77, *SD* = 0.95; α = .79). We measured perceived meaninglessness using the five-item scale from Study 2 (e.g., *M* = 3.86, *SD* = 1.62, α = .92, Van Tilburg & Igou, 2013). Self-awareness was measured using a trait version of the private self-awareness subscale from the situational self-awareness scale (e.g., "Usually, I am conscious about my inner feelings"; 1 = *strongly disagree*, 7 = *strongly agree*; *M* = 5.43, *SD* = 1.22; α = .79, Govern & Marsch, 2001). This three-item subscale measures the type of self-awareness used in self-regulation when people deal with adverse self-awareness associated with meaning threats (Moynihan et al., 2017b; Wisman et al., 2015). Finally, we measured

conformity using the ten-item conformity scale from Study 2a (M = 3.41, SD = 0.81; α = .74; Mehrabian & Stefl, 1995). Descriptive statistics are reported in Table 4.

Data screening. The distribution of disbelief in free will scores in Study 3a was significantly positively skewed, $S\text{-}W$ = 0.97, df = 96, p = .024. This skew was counteracted by conducting the square root transformation on those scores, $S\text{-}W$ = 0.99, df = 96, p = 0.504.

In Study 3b, the distribution of disbelief in free will scores was also significantly, positively skewed, $S\text{-}W$ = 0.97, df = 202, p < .001. This construct was also transformed using the square root formula to achieve normality, $S\text{-}W$ = .99, df = 202, p = .095. Similarly, self-awareness scores, $S\text{-}W$ = 0.91, df = 203, p < .001, were transformed using the inverse and square root formulas to reduce the number of outliers from twelve to zero, $S\text{-}W$ = 0.85, df = 203, p < .001, $S\text{-}W$ = 0.92, df = 203, p < .001. Scores for each variable were then standardized.

Results and Discussion

Zero-order correlations. In Study 3a, disbelief in free will correlated positively and significantly with perceived meaninglessness, $r(94)$ = .27, p = 0.007, 95% CI [0.08, 0.45], and conformity, $r(94)$ = .40, p < .001, 95% CI [0.22, 0.56]. Meaninglessness also correlated positively and significantly with conformity, $r(94)$ = .32, p = .002, 95% CI [0.13, 0.49].

In Study 3b, disbelief in free will correlated positively and significantly with perceived meaninglessness, $r(200)$ = .26, p < 0.001, 95% CI [0.13, 0.38], and conformity, $r(200)$ = .25, p < .001, 95% CI [0.12, 0.38]. Further, meaninglessness correlated positively and significantly with conformity, $r(200)$ = .23, p = .001, 95% CI [0.10, 0.36]. Collectively, these relationships were in accordance with our hypothesis. Having established these relationships, we proceeded to test our proposed mediation models.

Mediation analysis. Again, we predicted a significant indirect effect of disbelief in free will on increased conformity through perceived meaninglessness in Studies 3a and 3b.

To test this hypothesis, we conducted a mediation analysis using Hayes's (2012, Model 4) PROCESS macro. In Study 3a, disbelief in free will was entered as the predictor variable, perceived meaninglessness as the mediator, and conformity as the outcome variable. All scores were standardized. As expected, we found a significant indirect effect of disbelief in free will on conformity via perceived meaninglessness, $ab = 0.06$, $SE = 0.05$, 95% CI [0.001, 0.19]. The direct effect remained significant, $B = 0.34$, $SE = 0.10$, $p < .001$ (Figure 1). Thus, perceived meaninglessness mediated the relationship between disbelief in free will and conformity, supporting our hypothesis.

We also conducted a mediation analysis using Hayes's (2012, Model 4) PROCESS macro in Study 3b. As expected, there was a significant indirect effect of disbelief in free will on increased conformity through meaninglessness, $ab = 0.05$, $SE = 0.03$, 95% CI [0.01, 0.11]. The direct effect remained significant, $B = 0.21$, $SE = 0.07$, $p = .004$ (Figure 2). Hence, we replicated the results of Study 3a.

Moderated mediation analysis. Additionally, we proposed that the effect of disbelief in free will on conformity through perceived meaninglessness would be greater at higher levels of self-awareness. Accordingly, we supplemented our mediation model with self-awareness included as a moderator in Study 3b. This moderated mediation model was investigated using Hayes's (2012, Model 7) PROCESS macro. Disbelief in free will was entered as the predictor in the model, perceived meaninglessness as the mediator, self-awareness as the moderator, and conformity as the outcome variable (all standardized; Figure 3). As expected, the index of moderated mediation was significant, $B = 0.03$, $SE = 0.02$, 95% CI [0.01, 0.08]; self-awareness significantly interacted with disbelief in free will to predict increased meaninglessness perceptions, $B = 0.18$, $SE = 0.07$, $p = .011$. Indeed, there were significant conditional indirect effects in which the effect of disbelief in free will on

conformity through meaninglessness was significantly stronger at greater levels of self-awareness (Table 5). Thus, our hypothesis was supported.

Additional analyses. When the samples from Study 3a and 3b were combined (N = 299), random-effects meta-analyses produced consistent mean effect sizes for the correlations that composed the mediation models across the studies: (i) disbelief in free will and meaninglessness: d = 0.55, SD = 0.01, 95% CI [0.22, 0.89], (ii) meaninglessness and conformity: d = 0.54, SD = 0.09, 95% CI [0.21, 0.88], (iii) disbelief in free will and conformity: d = 0.64, SD = 0.17, 95% CI [0.30, 0.98]. Thus, there were significant relationships between the constructs that composed the mediation models across Studies 3a and 3b.

Similarly, there was a significant indirect effect of disbelief in free will on increased conformity via meaninglessness (Hayes, 2012, Model 4), ab = 0.05, SE = 0.02, 95% CI [0.02, 0.10] in our combined sample. Post-hoc analyses showed that our sample size when Study 3a and 3b samples were pooled allowed us to detect our achieved indirect effect with a power of 0.92 when adopting a Type-I error rate of $\alpha \leq .05$, 10,000 power analysis replications, and 20,000 Monte Carlo draws per replications (two-tailed; Schoemann et al., 2017).[6] A multiple group comparison also showed that the indirect effects between Study 3a and 3b did not differ significantly, B = 0.02, SE = 0.05, 95% CI [-0.06, 0.15].

In summary, we incorporated relationships from Studies 1 and 2 into our proposed theoretical model for Studies 3a and 3b. Disbelief in free will promoted conformity via perceived meaninglessness in both studies. Additionally, we supplemented our proposed mediation model in Study 3b with self-awareness as a moderator. Consistent with the literature on existential escape (Moynihan et al., 2015; Wisman et al., 2015), the effect of disbelief in free will on conformity through meaninglessness was significantly stronger at greater self-awareness (Moynihan et al., 2015; Moynihan et al., 2017b; Wisman et al., 2015).

That is, when the meaninglessness signaled by disbelief in free will is particularly salient, as under high self-awareness, people should conform (e.g., attempt to escape the self) more.

General Discussion

Our hypothesis was that disbelief in free will promotes conformity via perceived meaninglessness, particularly under high self-awareness. In our first study, we found the predicted, causal relationship between a threat to free will belief and perceived meaninglessness. In Study 2, meaninglessness correlated positively and significantly with conformity, compliance, and related avoidance behaviors. In Study 3, we found a significant indirect effect of disbelief in free will on increased conformity via perceived meaninglessness. Indeed, in Study 3b, the indirect effect was significantly stronger at higher levels of self-awareness, thus lending support to the existential escape hypothesis (Wisman, 2006; Wisman et al., 2015). These findings suggest that the effect of disbelief in free will on increased conformity is stronger at greater self-awareness to address the heightened perceptions of meaninglessness (e.g., Wisman, 2006).

Free Will Beliefs, Inferred Meaning, and Conformity

Our results add to the literature on free will beliefs, associated inferences of meaning, and self-regulatory processes affecting conformity. Belief in free will involves making choices based on one's own thoughts and values and being resistant to external pressures (Feldman et al., 2014; Feldman et al. 2016; Stillman & Baumeister, 2010; Stillman et al., 2011). In contrast, conformity refers to changes in behavior or attitudes designed to imitate or match those of real or imagined others. In some circumstances, these practices require little effort (Cialdini & Trost, 1998) and are also associated with rejecting reality (e.g., Asch, 1952; Gudjonsson & Sigurdsson, 2003). Thus, people who conform can yield to social pressure, rather than behaving in accordance with their own values and judgments, as is the case with belief in free will (e.g., Feldman et al., 2014). Indeed, certain types of conformity may be

used as avoidance coping strategies that address stressful events, involving a lack of autonomy, by withdrawing effort and thus the self (Gudjonsson & Sigurdsson, 2003).

Since reducing people's belief in free will makes them less willing to exert effort for volition and self-control (e.g., Baumeister et al., 2009; Vohs & Schooler, 2008), conformity may be a particularly useful strategy to deal with threats to belief in free will. Reduced free will beliefs lessens people's intentional efforts and leads them to select less demanding, easier, and automatic courses of action (Rigoni et al., 2011; Rigoni et al., 2012). Concurrently, conformity can be habitual and spontaneous (Epley & Gilovich, 1999) making it an attractive strategy in these circumstances (Alquist et al., 2013).

Simultaneously, disbelief in free will is associated with meaninglessness (Alquist et al., 2013; Bergner & Ramon, 2013; Crescioni et al., 2016; Kim et al., 2014; Seto et al., 2014). Meaninglessness has, in turn, been associated with conformity as a defense against meaning threats (Arndt et al., 2002; Wisman & Koole, 2003; Wisman & Shrira, 2006). Thus, increased conformity in response to disbelief in free will may be considered as a means of dealing with the perceived meaninglessness of that threat (e.g., Wisman, 2006).

Concurrently, our theoretical framework premises that losing self-awareness can be used as a defense mechanism in response to meaning threats (Kesebir & Pyszczynski, 2012; Wisman, 2006; see also Griskevicius et al., 2006). A sense of symbolic self-awareness is required to perceive the meaninglessness signaled by meaning threats (Kim et al., 2014; Sedikides & Skowronski, 2003). Directing attention toward the self initiates a self-evaluative process in which one's current state on a salient dimension is compared with ideal standards for that dimension (Duval & Wicklund, 1972). Thus, levels of discrepancy between the current self (meaningless) and ideal standards (meaningfulness; Heine et al., 2006) are noted.

Critically, Wisman (2006) argues that conformity engenders a loss of self-awareness in some cases (e.g., Diener, 1979; Mullen, 1991; Zimbardo, 2007). Since perceptions of

meaninglessness are enhanced under conditions of greater self-awareness (Sedikides & Skowronski, 2003; Taubman Ben-Ari & Noy, 2010), conformity, as an existential response, may be a particularly useful means to address the threat of disbelief in free will and specifically the meaninglessness that the threat signals. Thus, by abandoning the facility needed to perceive meaning threats (Kim et al., 2014; Sedikides & Skowronski, 2003), conformity would be an appropriate means to counteract the problematic meaninglessness signaled by disbelief in free will, particularly among those high in self-awareness (Wisman, 2006).

To our knowledge, the current studies are the first to demonstrate an existential function of disbelief in free will on conformity. A central contribution of our research that extends on earlier work by Alquist et al. (2013) is that at least part of the relationship between disbelief in free will and conformity can be interpreted as an attempt at existential escape (Wisman, 2006). Specifically, we propose that disbelief in free will promotes conformity, at least in part, as an attempt to escape from the existential threat signaled by threats to free will beliefs. In this regard, our research adapted a greater focus on the role of meaninglessness perceptions within free will beliefs' and conformity's relationship than preliminary findings noted in earlier research. In our research, we investigated and incorporated the roles of perceived meaninglessness and self-awareness in this relationship and interpret the findings using the existential escape hypothesis (Wisman, 2006). This particular explanation of the relationship between disbelief in free will and conformity has not been tested previously.

The Social Roots of Conformity as a Defense Mechanism

Wisman (2006) references human cultural evolution to speculate how conformity developed as an existential defense mechanism. Certain aspects of affiliation are related to innate mechanisms that play a role in coping with distress (MacDonald & Leary, 2005; Uchino, 2006). From this affiliation, protective behaviors such as conformity that suppress

self-awareness may have evolved through cultural development (Baumeister, 2008a, 2008b) to help people cope with meaning threats effectively (Wisman, 2006). Indeed, Griskevicius et al. (2006) note that social mind-sets facilitate functional perceptions, cognitions, and behaviors. These mind-sets often occur automatically and outside of conscious awareness. Consistently, Griskevicius et al. suggest that conformity serves as a strategy in protecting oneself from danger that facilitates actions designed to avoid self-awareness and addresses negative arousal (Dijksterhuis, Bargh, & Miedema, 2000; Schnuerch & Gibbons, 2014). That is, conformity may facilitate actions designed to avoid self-awareness and in turn help people to deal with meaninglessness (Wisman, 2006).

Mood

It is unlikely that mood is an alternative explanation of our findings. In previous research, the effects of belief in free will on meaning in life (Crescioni et al., 2016) and on conformity (Alquist et al., 2013) were maintained, controlling for mood. On a broader level, meaning-regulation strategies employed following meaning threats seem to be independent of negative affect (Van Tilburg & Igou, 2011, 2012). Mood did not mediate the relationships between meaning threats and consequent behaviors in previous research (Twenge, Catanese, & Baumeister, 2003) as they develop slower (e.g., Baumeister, DeWall, Ciarocco, & Twenge, 2005). Moreover, it has been argued that negative affect may later run parallel to these processes (DeWall, Twenge, Bushman, Im, & Williams, 2010).

Limitations and Future Directions

Our studies offer important directions for future research. When people encounter meaning threats, such as challenges to free will beliefs, they assess the resources afforded in their environment to help them to address meaninglessness (Jonas et al., 2014). Wisman (2006) postulates that those with stronger, coherent worldviews may manage meaning threats by worldview defense (Dechesne et al., 2003), whereas people with weaker, less coherent

worldviews or who feel incompetent to maintain the standards set by certain cultural norms may be more prone to engaging in existential escape. People may also be disinclined to regulate meaning using the symbolic self if their worldviews conflict with one another or are being refuted (Wisman, 2006). In relation, Wisman argues that if people feel that there are unable to reduce the perceived discrepancy between their actual (meaningless) and ideal (meaningful) selves, they may attempt to deal with meaning threats through existential escape (Carver, 1975; Gollwitzer & Wicklund, 1985; Silvia & Duval, 2001).

Based on free will beliefs' cognitive basis and links to social mind-sets (Baumeister 2008a, 2008b; Griskevicius et al., 2008), losing one's self-awareness by conforming may be an easily facilitated means to escape meaninglessness, which requires little self-regulatory expenditure, considering the nature of disbelief in free will on lowered volition (e.g., Alquist et al., 2013; Baumeister et al., 2009; Lynn et al., 2014; Rigoni et al., 2012; Stillman et al., 2011). Accordingly, there is likely a habitual, spontaneous process involving conformity as a defense against meaning threats, as we outline in our research. However, at times, conscious, deliberative processes involving the symbolic self (i.e., meaning structures; Sedikides & Skowronski, 2003) may instead operate within specific social contexts (i.e., affirming social identification with valued in-groups as a means of existential defense; Castano et al., 2004; Castano, Yzerbyt, Paladino, & Sacchi, 2002; Van Tilburg & Igou, 2011).

We also acknowledge other researchers' argument that uncertainty may be a supplementary explanation for findings in existential psychology (e.g., Van den Bos 2009a, 2009b; Van den Bos & Miedema, 2000). For example, mortality salience leads people to be more uncertain, suggesting that perceived uncertainty is an important psychological mechanism underlying mortality salience, or more broadly, meaning-regulation effects (Hohman & Hogg, 2011; Martin, 1999; Van den Bos & Lind, 2009; Yavuz & Van den Bos, 2009), at least in some contexts (Martin & Van den Bos, 2014). However, these effects were

mostly found among participants who thought of uncertainty *as a result* of mortality salience than those who did not (Van den Bos, Poortvliet, Maas, Miedema, & Van den Ham, 2005). Although not all meaning threats have a clear association with uncertainty (e.g., Heine et al., 2006), future research should examine if uncertainty is an additional variable in the existential escape process and crucially if it adds to predictability, at least in some cases.

Self-esteem. Other researchers highlighted that individual differences may influence people's propensity to conform in response to meaning threats (e.g., Alquist et al., 2013). One such factor is self-esteem (Goldenberg & Arndt, 2008). Wisman et al. (2015) argue that those with low self-esteem should be especially prone to existential escape as a response to meaning-threats. People with low self-esteem are more likely to experience negative self-discrepancies (Cheng, Govorun, & Chartrand, 2012; Ickes, Wicklund & Ferris, 1973; Pyszczynski & Greenberg, 1987) and lack the resources to affirm self-esteem as a defense. Other researchers have also suggested that low self-esteem, associated with disengaging from one's own values (e.g., the symbolic self), may mediate the effect of adverse self-awareness on conformity (Arndt et al., 2002; Gudjonsson & Sigurdsson, 2003). Therefore, it seems likely that those low in self-esteem, induced to disbelieve in free will, may be particularly likely to conform as an existential escape defense.

Non-conformity as a meaning source. Interestingly, conformity and non-conformity can both contribute to a meaningful, positive self-concept (e.g., Cialdini & Goldstein, 2004; Gudjonsson & Clark, 1986). Regarding the former, a coherent sense of self (Campbell et al., 1996; Swann, Rentfrow, & Guinn, 2002), as informed by one's group identity (e.g., Tajfel & Turner, 1979), can contribute to a sense of meaningfulness (Castano et al., 2004; Castano et al., 2002; Pyszczynski, Greenberg, & Solomon, 1997; Van Tilburg & Igou, 2011) and defend against meaning threats, using the symbolic self (Heine et al., 2006; Sedikides & Skowronski, 1997). Research on minority opinions has also shown that minority opinion holders can have

a more clearly defined sense of self than majority opinion holders (Rios, Morrison, & Wheeler, 2010), in particular when opinions are highly expressive of their values and among those who hold minority opinions relative to their in-group. Although affirming a coherent sense of self is a different meaning-regulation process than what is predicted by the existential escape hypothesis (Wisman, 2006), as it involves maintaining symbolic self-awareness (Sedikides & Skowronski, 2003), research on self-concept clarity sheds further light on how certain people may be more likely to engage in existential escape.

Diversity within conformity. Regarding the nature of the relationship between disbelief in free will and conformity, we understand conformity as a means to escape the conflicted self, which is especially functional when self-awareness, and with that the conflicted self, is high (Wisman, 2006). The route to conformity is conceptualized as a habitual, low-effortful process following threats to disbelief in free will that undermines self-regulation (Baumeister et al., 2009; Vohs & Schooler, 2008). That said, the actual process of conformity can take on different shapes with regard to the degree of consciousness and effortful processing. As highlighted previously, conformity can also be conceptualized as an active and engaging process, involving more cognitive processing (e.g., Cialdini & Goldstein, 2004; Haslam & Reicher, 2012). Whereas, conformity is sought to suppress awareness of the conflicted self, in other cases, conformity might go beyond this motive by drawing attention to and boosting the social self, but still drawing away attention from the conflicted self, a process that could be supported by certain individual differences, as previously highlighted.

Conformity as escape. Indeed, an alternative type of conformity could involve a sense of symbolic self-awareness for self-regulation purposes and active engagement, while monitoring one's adherence to group norms (Baumeister, 2005; Baumeister, Bauer, & Lloyd, 2011; Baumeister, Schmeichel, & Vohs, 2007; Carver & Scheier, 1982; Schnuerch & Gibbons, 2014). It could be argued from our data that increased conformity may be due to

willingness to please others or boost the symbolic self rather than as an attempt to suppress adverse self-awareness. Our studies were not designed to test the effects of conformity on reduced self-awareness. Yet, our chosen measure of conformity throughout our studies correlates with feelings of being influenced or controlled by a situation or others rather than the self (Mehrabian & Stefl, 1995). Further, our data shows that perceptions of meaninglessness associated with conformity involve high levels of self-awareness. Consistently, the desire to escape self-awareness has been associated with enacting escape behaviors, suggesting that conformity is used at least to try and escape from adverse self-awareness (e.g., Baumeister, 1991; Twenge et al., 2003).

Our conclusion rests on previous findings that people attempt to deal with adverse self-awareness by engaging in behaviors that suppress introspection (e.g., Duval & Wicklund, 1972), including conformity (Asch, 1952; Diener, 1979; Mullen, 1991; Zimbardo, 2007), consistent with the tenets of the existential escape hypothesis (Wisman, 2006). Our findings are also highly consistent with other literature on existential escape (e.g., Moynihan et al., 2015; Moynihan et al., 2017b) that in the vast majority of cases did not assess whether existential escape behaviors were ultimately successful in dealing with meaning threats. Indeed, there is evidence suggesting that conformity is an effective form of existential escape (e.g., Wisman & Koole, 2003; see also Wisman et al., 2015; Wisman & Shrira, 2015). Wisman and Koole (2003) found that mortality salience made participants more intent in sitting next to and among group members, as opposed to sitting alone. Moreover, this was true even when the increased affiliation meant that participants' worldviews (a source of meaning involving the symbolic self) were threatened by the group with whom they were affiliating and when affiliating with the group meant that participants had to attack their own worldviews. Indeed, increased interest in associating with others led to weaker defense of one's worldviews, an indicator that meaning threats have been dealt with effectively

(Greenberg, Solomon, & Pyszczynski, 1997). Wisman and Koole suggest that whereas worldview defense is presumably mediated by cultural–symbolic processes, the more immediate buffering function of affiliation may be mediated to a considerable degree by faster, automatic, sub-cognitive, biologically based mechanisms (see also Koole, Sin, & Schneider, 2014). Although the consequences of conformity and its potential multiple roles were not the central focus of our research, we acknowledge that more research is required to demonstrate the specific consequences of conformity in existential escape and their functionality.

Correlational designs. On another note, we mainly adapted correlational approaches to test our hypothesis. Casual evidence for the relationships between disbelief in free will and meaninglessness (Crescioni et al., 2016), disbelief in free will and conformity (Alquist et al., 2013), and meaninglessness and conformity (inherent in results found by Wisman & Koole, 2003) have been demonstrated previously, but not within an integrated and comprehensive model. As a result, our research has not yet established a causal relationship between the four major constructs. Although continuous predictor variables are acceptable to include in mediation analyses when the model and indirect effect(s) are informed by theory (Hayes, 2013; Hayes & Scharkow, 2013), as presented here, experimental replications of our proposed model are required. Experimental and longitudinal replications of these studies that examine (latent) cross-lagged mediation models will provide greater for our proposed model. Relatedly, in Study 3's results, the direct effects of disbelief in free will on conformity remained significant alongside the indirect effects, when both were accountable within the mediation model. Thus, the indirect effect we propose is likely one specific aspect of the relationship between disbelief in free will and conformity and other candidate mediators exist.

Practical applications. Regarding practical applications, disbelief in free will has been associated with several anti-social behaviors (e.g., aggression, cheating, lack of guilt; Baumeister et al., 2009; Vohs & Schooler, 2008; Stillman & Baumeister, 2010) that may relate to social phenomena such as conformity (e.g., Alquist et al., 2013; Zimbardo, 2007). Clark et al. (2014) suggested that situational factors could be investigated that promote beliefs in free will to help alleviate maladaptive behaviors that are associated with meaninglessness. Further, as meaning-regulation is a dynamic process (Heine et al., 2006), people could be educated about meaning-regulation responses and be provided with opportunities to regulate meaning that is more beneficial for individuals and society. Understanding the relationships between these psychological constructs may ultimately inform personal development programs (e.g., Vohs & Baumeister, 2010).

Conclusion

We reckon that our studies are the first to indicate an existential function of conformity in response to disbelief in free will. Disbelief in free will promotes meaninglessness and motivates people to conform as an existential defense, especially when self-awareness is high. Reducing self-awareness to reduce the existential conflict then likely becomes the regulatory goal. Consistently, we found that promoting disbelief in free will increased meaninglessness perceptions, using different materials from previous literature (Crescioni et al., 2016). We also addressed a gap in the literature by directly focusing and identifying a relationship between meaninglessness perceptions and increased conformity. Perhaps most importantly, perceived meaninglessness explained part of the relationship between disbelief in free will and conformity. Further, our results suggest that this effect is more pronounced at higher levels of self-awareness, suggesting that people may deal with perceived meaninglessness, signaled belief in free will, and captured by self-awareness, through an existential escape process resulting in conformity.

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Footnotes

[1] Although in the context of existential escape, meaning search is not a central variable, we included an item assessing meaning search at the end of Study 1 ("To what extent did the text you read make you feel like doing something more meaningful?" 1 = *not at all*, 7 = *very much*; $M = 3.27$, $SD = 1.92$; Van Tilburg & Igou, 2011, 2012) for exploratory reasons after other measures were taken. We did not find a significant difference in meaning search between the pro ($M = 3.33$, $SD = 2.03$) and anti-free will ($M = 3.23$, $SD = 1.86$) conditions, $F(1,83) = 0.07$, $p = .798$, $\eta^2 = 0.001$. Interestingly, we did find a significant positive correlation between the meaning search item and perceived meaninglessness, $r(83) = .35$, $p = .001$, 95% CI [0.15, 0.52], consistent with other literature (e.g., Heine et al., 2006). There was also a significant positive correlation between meaning search and doubt cast on belief in free will, $r(83) = .40$, $p < .001$, 95% [0.21, 0.57], consistent with literature indicating free will belief as a source of meaning (Bergner & Ramon, 2013; Crescioni et al., 2016; Moynihan et al., 2017a).

[2] As the manipulation in Study 1 simultaneously elicited differences in free will beliefs and meaninglessness, we conducted a correlational analysis on the manipulation check and meaninglessness items. There was a significant, positive correlation between threatening beliefs in free will and meaning, $r(83) = .51$, $p < .001$, 95% CI [0.33, 0.65]. We also conducted a mediation analysis using Hayes's (2012) PROCESS macro to assess if casting doubt on beliefs in free will mediated the effect of the manipulation on perceived meaninglessness. The free will belief manipulation (effect-coded: -1 = *belief in free will*, 1 = *disbelief in free will*) was entered as the independent variable in the model, the manipulation check item was entered as the mediator, and the meaninglessness item as the outcome variable (Hayes, 2012, Model 4). Scores for the mediator and outcome variable were standardized. We found a significant indirect effect of the free will belief manipulation on

threats to meaning through casting doubt on belief in free will, *ab* = 0.19, *SE* = 0.06, 95% CI [0.09, 0.34]. The direct effect of the belief in free will manipulation on meaninglessness was not significant when controlling for the mediator, *B* = 0.09, *SE* = 0.10, *p* = .371. Post-hoc power analyses showed that our sample size also allowed us to detect our achieved indirect effect with a power of 0.97 when adopting a Type-I error rate of $\alpha \leq .05$, 10,000 power analysis replications, and 20,000 Monte Carlo draws per replications (two-tailed; Schoemann et al., 2017).

[3] Compliance refers "to the tendency of the individual to go along with propositions, requests, or instructions for some immediate instrumental gain" (Gudjonsson, 1992, p. 137). Compliance further refers to attempts to avoid confrontation and as a result may also involve privately disagreeing with an explicit or implied request (Cialdini & Trost, 1998). We included compliance within our analysis since conformity and compliance are strongly related constructs (e.g., Gudjonsson, 1989) and fulfil similar goals (e.g., avoidance coping in response to distressing emotions, particularly in socially pressurized situations, Cialdini & Trost, 1998; Cialdini & Goldstein, 2004). Regarding our chosen theoretical framework, compliance has been identified as a coping mechanism to lower adverse self-awareness (Milgram, 1974; Tilker, 1970), for example in avoiding conflict (Gudjonsson & Clark, 1986). This strategy may be useful in response to meaning threats (Wisman & Koole, 2003; Wisman & Shrira, 2006) and is also relevant to conformity (e.g., Diener, 1979; Mullen, 1991; Zimbardo, 2007).

[4] Initially, we underestimated the sample size required for Study 2b and thus had to add participants. This is because we had only a rough idea of the potential effect size in this study due to a lack literature on this topic. Data for Studies 2a and 2b were collected simultaneously.

[5] Initially, we underestimated the sample size required for Study 3b and thus had to add participants to achieve the desired sample size. In Study 3a, based on the effects found, at least one hundred and fifty six participants would have been required to achieve adequate statistical power for our achieved indirect effect (Schoemann et al., 2017). In turn, we recruited two hundred and three participants for Study 3b.

[6] In the Additional Analyses, excluding the multiple group comparison, the combined scores for disbelief in free will were transformed using the square root formula, $S\text{-}W = 0.99$, $df = 298$, $p = .062$, as the raw scores were significantly and positively skewed, $S\text{-}W = 0.97$, $df = 298$, $p < .001$.

Table 1

Descriptive Statistics (Study 1)

Doubt in Free Will	*N*	*M*	*SD*	Max	Min
Pro-Free Will Condition	36	2.56	1.65	6.00	1.00
Anti-Free Will Condition	49	4.12	1.89	7.00	1.00
Perceived Meaninglessness	***N***	***M***	***SD***	**Max**	**Min**
Pro-Free Will Condition	36	2.36	1.57	6.00	1.00
Anti-Free Will Condition	49	3.39	1.88	7.00	1.00

Note. N = Sample Size, *M* = Mean, *SD* = Standard Deviation

Table 2

Descriptive Statistics (Study 2a & 2b)

Study 2a Variables	*N*	*M*	*SD*	Max	Min
Conformity	80	3.42	0.89	5.46	1.00
Perceived Meaninglessness	80	3.68	1.55	7.00	1.00
Study 2b Variables	***N***	***M***	***SD***	**Max**	**Min**
Compliance	106	3.80	0.80	5.80	1.80
Avoidance of Self	106	3.67	0.90	6.40	1.80
Perceived Meaninglessness	107	3.51	1.45	6.40	1.00

Note. N = Sample Size, *M* = Mean, *SD* = Standard Deviation

Table 3

Descriptive Statistics (Study 3a)

Variables	*N*	*M*	*SD*	Max	Min
Disbelief in Free Will	96	2.72	1.05	5.86	1.00
Perceived Meaninglessness	96	3.71	1.60	7.00	1.00
Conformity	96	3.49	0.86	5.64	1.55

Note. N = Sample Size, *M* = Mean, *SD* = Standard Deviation

Table 4

Descriptive Statistics (Study 3b)

Variables	*N*	*M*	*SD*	Max	Min
Disbelief in Free Will	202	2.77	0.95	5.43	1.00
Perceived Meaninglessness	202	3.86	1.62	7.00	1.00
Conformity	203	3.41	0.81	5.82	1.45
Self-Awareness	203	5.43	1.22	7.00	1.00

Note. *N* = Sample Size, *M* = Mean, *SD* = Standard Deviation

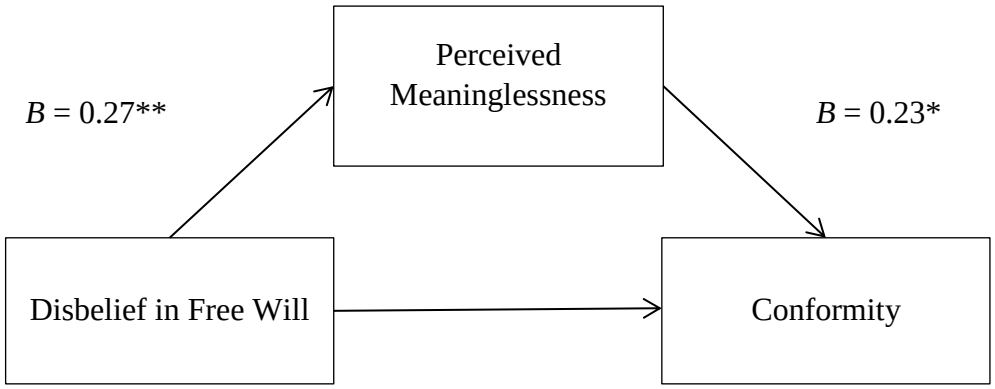
Table 5

Conditional Indirect Effects of Disbelief in Free Will on Conformity, via Meaninglessness, at Levels of Self-Awareness (Study 3b)

Self-Awareness	Effect	*SE*	95% CI
-0.99	0.02	0.02	[-0.015, 0.08]
0.01	0.05	0.03	[0.01, 0.11]
1.00	0.08	0.04	[0.02, 0.17]

Note. SE = standard error. CI = confidence interval at 95%.

Figure 1: *Conceptual Representation of the Mediation Model (Study 3a)*



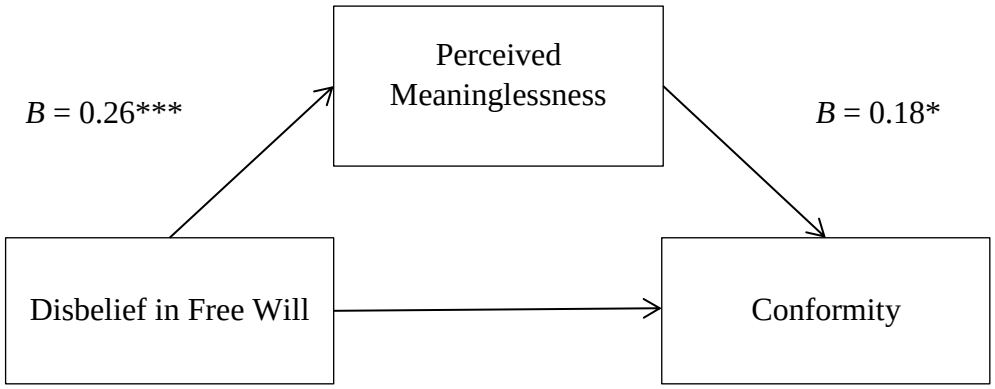
*p < .05

**p < .01

***p < .001

Figure 1: The relationships between disbelief in free will and conformity, significantly mediated by perceived meaninglessness.

Figure 2: *Conceptual Representation of the Mediation Model (Study 3b)*



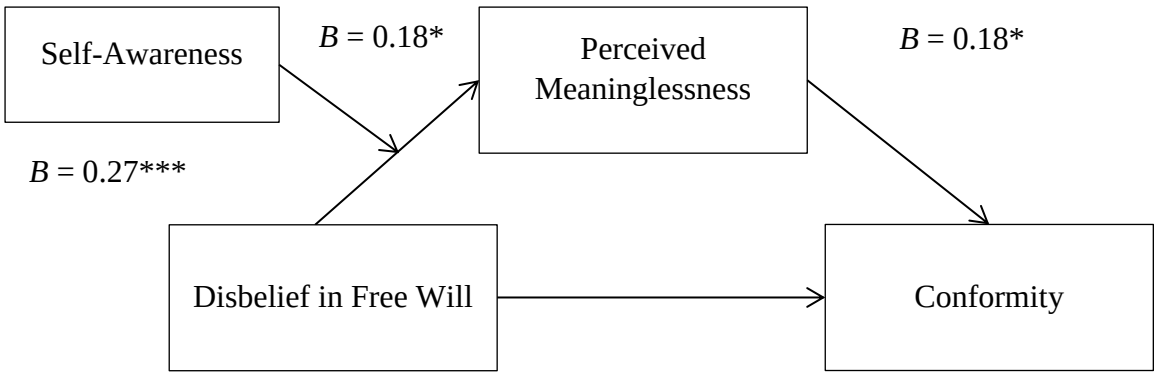
*$p < .05$

**$p < .01$

***$p < .001$

Figure 2: The relationships between disbelief in free will and conformity, significantly mediated by perceived meaninglessness.

Figure 3: *Conceptual Representation of the Moderated Mediation Model (Study 3b)*



*$p < .05$

**$p < .005$

***$p < .001$

Figure 3: The relationships between disbelief in free will and conformity, significantly mediated by perceived meaninglessness. The mediation model was significantly moderated by self-awareness.